NEW JAPANESE MARINE MOLLUSCA.

BY HENRY A. PILSBRY.

The new species described herein are further evidences of the energy and industry with which Mr. Hirase is investigating the molluscan fauna of his country. For the illustrations I am indebted to Mr. Vanatta.

A name used by me last year, *Terebra hedleyi*, proves to have been applied before to a different species.[1] I propose, therefore, to change the name of the Japanese species to *Terebra hedleyana*. The description may be found in these *Proceedings* for 1904, p. 3.

Conus voluminalis avus n. subsp. Pl. II, fig. 4.

General form of *C. voluminalis* Hinds, but the later whorls are almost flat instead of concave above, and are smooth except for weak oblique growth-wrinkles. The conic earlier whorls are weakly marked with about three spiral lines, and the angular periphery is very slightly nodulous and projects a little above the suture. The last whorl is smooth except for about twelve grooves at the base.

Length 38, diam. 19 mm.

Kikai, Ōsumi, in a deposit probably of Pliocene age. Types No. 88,296, A. N. S. P., from No. 1,578 of Mr. Hirase's collection.

Conus aratispira n. sp. Pl. II, fig. 1.

Shell slender and long, with high, turreted spire, biconic, the cone of the spire about one-third the total length, somewhat terraced, the whorls angular in the middle, smooth below the angle, steeply sloping and marked with 4 or 5 spiral grooves above it, the shoulder of the intermediate whorls very weakly tuberculate in well-preserved specimens. Last whorl obliquely striate toward the base, the grooves and convex intervals of equal size below, but upwards they become more widely spaced, with wide flat intervals. The aperture is narrow, its length about three-fourths that of the shell.

Length 42, diam. 13.5 mm.

Length about 48, diam. 16 mm.

Kikai, Ōsumi, in a deposit of probably Pliocene age. Types No. 88,297, A. N. S. P., from No. 1,579 of Mr. Hirase's collection.

This belongs to a small group of cones with the spire much elevated.

[1] See *Proc. Linn. Soc. N. S. W.*, 1904, pp. 187, 211.

Columbella pardalina subcribraria n. subsp. Pl. IV, fig. 23.

Shell obesely fusiform, swollen in the middle; dark brown closely spotted with white, without a darker or otherwise differentiated subsutural band. There are some spiral striæ at the base, but the surface is otherwise smooth. The aperture is narrow, sinuous, more than half the length of the shell, the outer lip decidedly thickened within in the middle, armed with about five tubercular or elongated teeth; apex entire or nearly so. Whorls 7 to 7½. Length 11.5, diam. 5.5 mm.

Hahajima, Ogasawara. Types No. 88,924, A. N. S. P., from No. 1,606 of Mr. Hirase's collection.

This form has a superficial resemblance to *C. cribraria*, but the shape of the aperture shows it to be related to *C. pardalina japonica* Rve. (+*C. sagena* Rve.). *C. p. subcribraria* is only about half the size of its larger cousin, its aperture is slightly less contracted and the spots are smaller, but otherwise the two forms do not differ materially.

Buccinum unicum n. sp.

Shell solid but rather thin, ovate-conic, fleshy-whitish under a very thin, smooth, dehiscent light olive cuticle. The last whorl has a strong keel at the shoulder, above which the surface slopes up to the suture, with a second obtuse keel a little nearer to the suture than to the first keel. Below the shoulder keel the surface is at first slightly concave, then evenly convex and rather swollen, contracting as usual below. The whorls of the spire are terrace-like, and the last 4 at least are carinated like the last whorl, those above being deeply eroded. Whorls 6. The base is sculptured with strong spiral cords, gradually diminishing toward the periphery. Over the whole there is a minute sculpture of fine spiral striæ, beautifully crenulated by minute growth-striæ. The aperture is white within, outer lip simple and unexpanded. The columellar margin is concave in the middle, straight below. The anterior notch is moderately wide and deep. The inner lip is covered with a white enamel, preceded by an eroded groove.

Length 58.5, diam. 32, length of aperture 31 mm.

Kisennuma, Rikuzen. Type No. 88,820, A. N. S. P., from No. 1,761 of Mr. Hirase's collection.

This peculiar whelk has much resemblance in general figure to *Buccinum taphrium* Dall, type of the section *Sulcosinus*. It is more elongated than that, and differs further in the less spreading columellar callous, the much less sinuous columella, the additional keel above the shoulder, and in not having a channelled suture, though the upper keel, in a more depressed shell, would define a channel. It seems to connect *Sulcosinus* with the more normal forms of *Buccinum*.

Buccinum chishimanum Pilsbry. Pl. III, fig. 20.

Nautilus, XVIII, p. 87, December, 1904.

Etorō, Chishima (Kuril Is.).

Siphonalia vanattai n. sp. Pl. III, fig. 12.

The shell is obesely-fusiform, the greatest width about median, solid and strong; white, irregularly marked with dull purplish-brown spots of irregular shape, and with narrow reddish-brown spiral lines, most distinct behind the lip, six and equidistant or fewer by the omission of some of them. Whorls 6 (the protoconch being lost in the specimens seen), longitudinally costate, 13 to 15 rounded ribs on the last whorl, where they are most prominent at the shoulder, rapidly diminishing below it, and not extending upon the base; sculptured throughout with spiral rounded cords with threads occasionally interposed. The last two whorls are subangular at the shoulder, the preceding whorls being very convex. Last whorl is strongly contracted below. The aperture is oblique, its length (including the anterior canal) about two-thirds that of the shell, pale, dull, reddish-brown inside becoming ochre-fleshy between the liræ, pure white on the bevelled edge. It is rather sharply sulcate within. The outer lip is symmetrically arched. Anterior canal deep and moderately recurved.

Length 28, diam. 15 mm.; aperture to end of canal 19 mm.

Length 26, diam. 13.7 mm.; aperture to end of canal 17 mm.

Yakushima, Ōsumi. Types No. 87,746, A. N. S. P., from No. 1,602 of Mr. Hirase's collection.

This small species resembles *S. hinnulus* in general contour and coloration; but it is much smaller, decidedly plicate, and lirate within the aperture. It does not seem to agree with any of the numerous unfigured and insufficiently described forms introduced by A. Adams. *S. spadicea* is more slender than *S. vanattai.*

Twenty-seven species of *Siphonalia* are now recorded from Japan. Of these, *S. hyperodon* Pils. is a synonym of *S. mikado* Melvill.[2] *S. stearnsii* Pils. is closely related to *S. pseudobuccinum* Melv., but seems to differ by its shorter anterior canal. *S. semiplicata* Pils. is a synonym of *S. fusoides* Rve., while *S. longirostris* Dkr. seems to be merely a variety of the same species. Eleven species have been described without figures by A. Adams. Omitting these, there remain about fourteen recognizable Japanese Siphonaliæ.

Maculotriton bracteatus longus Pils. and Van. Pl. III, fig. 13.

Proc. A. N. S. Phila. for 1904, p. 595.

Tanabe, Kii.

Length 11.5, diam. 4.7 mm.

[2] *Journ. of Conchology*, V, p. 348.

Usilla gouldii (Smith). Pl. III, fig. 14.

Planaxis cingulata Gld., Otia Conch., p. 140, not of A. Adams.
Planaxis gouldii E. A. Smith, Ann. and Mag. N. H., 1872, IX, p. 42.

Shell ovate-oblong, thick and solid. On the last whorl there is a subsutural welt followed by a depression, then seven slightly convex girdles separated by narrower spaces, each occupied by a single low cord at and above the periphery, but on the base the spaces are wider, with two or three cords; on the spire a microscopic, dense subvertical striation may be seen in unworn specimens. The girdles are very low, almost flat on the latter part of the last whorl, but more and more raised earlier, two strong ones appearing on the penultimate whorl, where they are somewhat nodose. On the earlier whorls these two girdles and the subsutural welt are set with transversely oblong tubercles along weak vertical folds. Siphonal fasciole short and convex. Whorls about 6½, the tip minutely eroded, the first whorl smooth. Last whorl tapering and a little concave below the slightly swollen peripheral region. Aperture oblique, about three-fifths the total length of the shell, blackish within, with a single peripheral pale line. Anterior channel short and deep, posterior sinus narrow and gutter-like, defined by a curved ascending callous cord on the lip and a small callous pad on the body. Outer lip regularly arcuate, thickened within and armed with six teeth in adult shells. Columellar margin dilated, rather wide. Color blackish-brown, with blue spots on some of the spiral girdles, the tubercles on the spire and a few bands in intervals on the last whorl being yellowish. Behind the lip all of the intervals between the raised girdles become yellowish, terminating in subtriangular yellow spots on the bevelled lip, seven in number.

Length 13.2, diam. 7 mm.

Length 11.7, diam. 6 mm.

Hahajima, Ogasawara. The specimens described are No. 87,754, A. N. S. P., from No. 1,628 of Mr. Hirase's collection. Gould's types were from Ōshima, Ōsumi.

This peculiar little whelk has been unfortunate in its biographers. Dr. Gould placed it in a wrong genus and family, and used a preoccupied specific name; and Mr. Smith, who renamed it, had not seen a specimen, and left it in the genus *Planaxis*. Pease, in a note on *Usilla fusconigra*, alludes to Gould's species as a member of *Usilla*.[3] The species has not been figured hitherto.

The group *Usilla* has been considered a subgenus of *Vexilla*, and located in the *Purpurinæ*. The rather flat columella, and yellowish

[3] *Amer. Journ. of Conch.*, IV, 115.

bands of the shell, and the microscopic vertical lineolation discernible in places on *U. gouldii* are in favor of this classification, while the form of the shell and the other characters of the aperture remind one more of *Pisania* or *Tritonidea* in the *Buccinidæ*. Until the dentition can be examined, the position of *Usilla* must be left in doubt.

U. gouldii is a larger and rougher species than *U. fusconigra*, with the spire much more strongly sculptured. No other species are known to belong to the group.

Columbella liocyma Pils.

Described in these *Proceedings*, 1894, p. 14. The locality, Hachijo, Izu, was omitted.

Planaxis abbreviata ogasawarana n. subsp. Pl. III, figs. 18, 19.

The shell is larger and longer than *P. abbreviata* Pease, ovate-conic, thick and solid, chocolate-brown, the last whorl covered with a dull fibrous cuticle. Sculpture of spiral grooves, often weak in the middle of the last whorl, strong below the suture and at the base. Whorls about 6, convex. Aperture oblique, the outer lip thickened within, and bearing 11 to 14 liræ, which *extend into the throat;* basal and posterior notches small, deep and rounded.

Length 13, diam. 7.7 mm.

Length 12, diam. 7 mm.

Hahajima, Ogasawara. Types No. 87,769, A. N. S. P., from No. 1,629 of Mr. Hirase's collection.

This is a more robust form than *P. nigra*, with liræ in the throat like the Polynesian *P. abbreviata.*

Natica (Haloconcha) hirasei n. sp. Pl. II, figs. 5, 6.

Shell *wholly imperforate*, similar in shape to *N. clausa* B. and S. Brown-tinged white, with two chocolate-brown bands, which are more or less interrupted into spots or oblique streaks, one in the middle of the upper surface and ascending upon the penultimate whorl, the other immediately below the periphery. The surface is rather dull, marked with growth-lines, and showing faint, fine, subobsolete spiral striæ. Whorls 4½, convex, the spire very small. The aperture is oblique, half-round and chestnut colored inside, with a pale entering basal band and wide white lip-margin. The umbilical pad is small, semicircular, bounded by a furrow, and *separated from the parietal callous by a rather large notch.*

Length 17, diam. 15 mm., operculum 10 x 6.7 mm.

Length 15.5, diam. 14.5 mm.

The operculum (fig. 5) is ovate, slightly concave and white exter-

nally, with a short, low, curved rib over the spiral part, and a very faint impressed line parallel to the outer margin. The edge is rather thick.

Akkeshi, Kushiro, Hokkaido. Types No. 87,768, A. N. S. P., from No. 1,618 of Mr. Hirase's collection.

This species differs from *N. clausa* by the color-belts of the shell, the notch between the umbilical pad and the parietal callous, and the faint line parallel with the outer margin of the operculum. It differs from *N. janthostoma* Desh. and *N. adamsiana* Dkr. by the closure of the umbilicus, and in wanting strong grooves on the operculum.

Torinia densegranosa n. sp. Pl. III, figs. 15, 16, 17.

The shell is rather openly umbilicate, depressed-conic, dull light reddish-brown, with some indistinct darker and yellowish spots along the periphery. The spire is low-conic, apex obtuse; whorls $5\frac{1}{2}$, but slightly convex, the last rounded peripherally. The sculpture consists of unequal flattened spiral cords and threads, cut by *very fine, close and regular radial grooves.* The cords are rather wide and flat except near the periphery, where two or three of them are convex and slightly prominent. Four spiral cords are visible on the upper surface, with a thread between the third and fourth. On the periphery there are two with a thread between them. On the base there are five; the outer one smaller, with a thread on each side of it, the umbilical cord coarsely crenate, the next outer one with only about half as many radial incisions as the following cords. There is a fine, not very distinct, spiral striation over the coarser sculpture described. The aperture is notched at the termination of the umbilical cord. The operculum is a conic stack of thin yellow lamellæ.

Alt. 5, diam. 8.5 mm.

Fukura, Awaji. Types No. 88,306, A. N. S. P., from No. 1,568 of Mr. Hirase's collection.

Chiefly notable for the close radial sculpture. The sculpture of the base, omitted in fig. 16, is shown enlarged in fig. 17.

Cingula kurilensis n. sp. Pl. IV, fig. 31.

Shell minutely perforate, ovate-conic, dark brown with more or less extensive, eroded, ashen patches, sometimes the whole surface eroded. Marked with fine, inconspicuous growth-lines where unworn. Whorls 5, convex, the last ventricose. Aperture roundly-ovate, slightly subangular. Peristome thin and simple, continued in an adherent callous across the parietal wall. Columella arcuate.

Length 3.3, diam. 2, longest axis of aperture 1.7 mm.

Kunashiri, Chishima [Kuril Is.]. Types No. 88,303, A. N. S. P., from No. 1,599 of Mr. Hirase's collection.

This little *Amnicola*-like snail is smaller than *Cingula robusta* 'Dall' Krause, and has no spiral sculpture. It is a wider shell than *Onoba aleutica* Dall, which seems to be its nearest relative.

EULIMIDÆ.

In my *Catalogue of the Marine Mollusks of Japan*, p. 77, some 23 species of *Eulima* are recorded, exclusive of *Leiostraca*, etc. Of this number "*E. cumingi* Sowb." may have been an erroneous identification, but as the specimen upon which it was based is not now accessible to me, I am unable to revise it. The original *E. cumingi* A. Ad.[4] was described from "Lord Hood's Island, South Pacific," but, as in numerous other cases, the island intended by the label may have been one of the Galapagos group, for the species does not seem to differ materially from *Eulima splendidula* Sowb.,[5] described from St. Elena, west coast of Colombia.

The name *Eulima stenostoma* A. Ad. is preoccupied for a species described by Jeffreys, and may therefore be ignored. There remain 18 species "described" by Arthur Adams in his absurdly inadequate manner, *without dimensions* or mention of the varices. While nobody would presume to identify specimens by these diagnoses, it is frequently possible to ascertain that no one of them corresponds wholly with a particular specimen in hand. To facilitate such use of the descriptions, I have recast the whole of them in the accompanying table. The most prominent characters of any specimen may now be compared with the entire series by glancing down the appropriate column, without the waste of time and diversion of attention ensuing from reading over the whole descriptions.

[4] *Proc. Zool. Soc. Lond.*, 1851, p. 277.
[5] *Conchol. Illustrations*, fig. 7.

	Form.	*Curvature.*	*Whorls.*	*Suture.*	*Varices.*	*Last Whorl.*	*Aperture.*	*Peristome.*	*Color and Dimensions.*
E. robusta.	Pyramidal-subulate.	Flexuous, apex recurved.	Slightly convex.	Margined.		Large, oblique, rounded bassally.	Ovate, produced.	Inner lip thickened above, outer lip arcuate.	Milk-white, semiopaque.
E. clavula.	Acutely pyramidal.	Apex inclined backward.	8, planulate.	Margined.		Wide, slightly angulate at periphery, oblique at base.	Small, ovate, effuse.	Inner lip thickened.	Milk-white, opaque, rather solid.
E. pinguicula.	Acutely pyramidal.	Arcuate, apex inclined forward.	8, planulate.			Large, oblique, obtusely angulate at periphery, oblique at base.	Small, porrect, ovate.	Inner lip thin, arcuate.	Milk-white, opaque, solid.
E. curvata.	Subulate, slender.	Arcuate, inclined forward.	7, planulate.			Elongate, produced forward.	Long oval.	Inner lip thin, curved.	White, opaque, rather solid.
E. mundula.	Subulate.	Tortuose, the spire laterally curved.	9, a little convex.			Ample, oblique at base.	Ovate, produced.	Inner lip thickened, outer arcuate, slightly inflexed.	Milk-white, subopaque.
E. stylata.	Subulate.	Slightly flexuose, spire laterally curved.	8, planate.	Obsoletely impressed.		Elongate.	Oblong, produced forward.	Lip arcuate.	White, opaque.
E. acicularis.	Subulate-pyramidal.	Posteriorly somewhat recurved, apex obtuse.	7, planate.			Angulate at the periphery.	Subrhombic.	Lip angulate in the middle.	White, semiopaque.

E. flexa.	Subulate.	Flexuous, spire laterally and then posteriorly inclined.	About 12, planate.	Obsolete.		Long, rounded.	Ovate, acuminate posteriorly.	Inner lip thin.	Milk-white, semiopaque.
E. pandata.	Subulate, slender.	Flexuous, spire laterally inclined.	8, planate.			Long, produced forward.	Oblong, dilated anteriorly.	Inner lip thin, outer arcuate.	Milk-white, subopaque.
E. reclinata.	Subulate-pyramidal.	Spire acute, inclined backward.	6, planate.			Large, long, slightly angulate at periphery.	Oblong, anteriorly produced.	Lip subangulate in the middle.	Milk-white, opaque.
E. semitorta.	Subulate.	Subflexuose.	10, planate.			Long, rounded at periphery.	Ovate, posteriorly acute, anteriorly produced and dilated.	Inner lip thin, arcuate.	White, rufous tinted, thin, semipellucid.
E. eburnea.	Subulate.	Flexuous, spire recurved.	8, planate.			Large, wide, rounded.	Ovate, acute.	Inner lip rather straight, outer arcuate.	Ivory-white, solid.
E. dentaliopsis.	Subulate-pyramidal.	Straight, apex subobtuse.	9, planate.	Distinct.		Angulate at periphery.	Ovate.	Inner lip thin, outer arcuate in the middle.	White, glossy, subpellucid.
E. angulata.	Pyramidate-subulate.	Flexuous, apex recurved.	11, planate.			Angulate.	Short, ovate.	Inner lip thickened, short, straight, outer angulate in the middle.	White, opaque, solid.
E. valida.	Subulate.	Straight.	10, planate.		Last and penult. whorls varicose.	Rounded.	Oblong, produced in front.	Inner lip short, thickened, the outer lip arcuate.	White, opaque, solid.

	Form.	*Curvature.*	*Whorls.*	*Suture.*	*Varices.*	*Last Whorl.*	*Aperture.*	*Peristome.*	*Color and Dimensions.*
E. odontoidea.	Subulate.	Subflexuous, spire attenuate.	10, planate.			Ample, rounded.	Ovate, produced in front and narrowed.	Inner lip short, thin, curved, outer produced and arcuate.	Milk-white, semiopaque.
E. chrysallida.	Subrimate, ovate-subulate.	In the middle thickened, straight, apex slightly inclined.	11, slightly convex.	Margined.		Rounded.	Ovate.	Inner lip thin, rather straight, outer margin produced in the middle.	White, solid, semiopaque.
E. debilis.	Short, subulate.	Straight.	7, planate.			Long, dilated at the base.	Ovate.	Inner lip thin, slightly curved, outer margin produced and arcuate.	White, thin, semipellucid.
E. indeflexa.	Pyramidal-subulate.	Straight.	10, planate.	Margined.		Large, rounded.	Ovate, anteriorly dilated.	Inner lip regularly curved, the outer margin dilated and arcuate in the middle.	White, opaque, solid.
E. scitula.	Subulate, at base dilated.	Slightly flexuous, spire laterally inclined.	9, planate.			Rounded, dilated in the middle, obliqueat base.	Ovate.	Inner lip arcuate.	White, thin, semipellucid.
E. carneola Gld.	Elongate-conic.	Apical 3 whorls pillar-like, the first globose, then 2 conic and 5 planate whorls.		Scarcely marked.		Base rounded.		Outer lip hardly sinuate, thickened.	Subdiaphanous, fleshy, very glossy, 4+x 1.5mm.

It will of course be understood, in studying descriptions of *Eulimidæ*, that the terms "spire inclined posteriorly," "apex recurved," etc., are not in themselves significant, except in species with the varices all on one side. In forms with alternately right and left varices, the spire will be inclined first toward one, then toward the other side, or the apex either forward or backward; and in species with irregular varices, the curvature may be in any direction. Moreover, the count of whorls is not especially significant except in combination with the length of the shell. As in any shell having varices, there is no certain criterion of adult growth except where a number of specimens are in hand.

Eulima bovicornu n. sp. Pl. II, figs. 9, 10.

Shell moderately solid but not thick, white and glossy, the spire regularly tapering, attenuate near the apex, *strongly bent to the right* and backward. Whorls about 13, slightly convex, the sutures but lightly impressed. *Varices distinctly impressed, one on each whorl, all on the right side*, where they form a slowly receding ascending line, each succeeding one being very slightly in advance of the preceding. The aperture is ovate, the outer lip obtuse, arching well forward in the middle, receding above. Columella short, concave, slightly calloused but without a reflexed edge.

Length 15, diam. 4.7 mm.

Length 13, diam. 4.3 mm.

Hahajima, Ogasawara. Types No. 88,309, A. N. S. P., from No. 1,603 of Mr. Hirase's collection.

This species is apparently a near relative of *E. tortuosa* Adams and Reeve[6] from the China Sea, but that species is, from the figure, a little more slender, more attenuated near the apex, and it has a longer, vertical and straightened columella. With a length of about 12 mm., *E. tortuosa* is said to have 12 to 14 whorls.

Another specimen was sent from Kikaiga-shima, Ōsumi.

Eulima ogasawarana n. sp. Pl. II, figs. 2, 3.

Shell *thick* and solid, white and polished, the spire somewhat attenuated above and noticeably bent, acute. Whorls 12 or 13, nearly flat, the suture impressed and *distinct*. *Varices very few*, only 3 or 4 on the whole shell, irregularly placed and *deeply impressed*. Aperture small and ovate, vertical, the *outer lip very thick, but little arched for-*

[6] *Zool. 'Samarang,'* p. 53, Pl. 11, fig. 26. The figure in the *Conch. Iconica* does not look like the same species. It has been copied by Tryon in the *Manual of Conchology*.

ward in the middle. Columella heavily calloused, with *broadly reflexed appressed edge.*

Length 11.3, diam. 3.5 mm.

Length 10.3, diam. 3.3 mm.

Hahajima, Ogasawara. Types No. 88,311, A. N. S. P., from No. 1,604 of Mr. Hirase's collection.

This species is much thicker than *E. valida,* with deeper varical furrows and calloused columella. It is also more bent.

Eulima luchuana Pils. Pl. 11, figs. 7, 8.

Proc. A. N. S. P., 1901, p. 396.

Shell rather thin, white and glossy, regularly tapering, almost straight, though there is a quite perceptible curvature near the apex. Whorls 10 or 11, slightly convex, the suture but slightly marked. Varices slightly impressed, not very distinct, mostly separated by the space of somewhat more than a whorl, and therefore quite irregularly placed. The aperture is acuminate-ovate, the outer lip obtuse, arched forward in the middle, retracted above and below; the columella slightly concave, slightly calloused, the edge not reflexed.

Length 11, diam. 3.7 mm.

The specimens originally described from Loochoo (Okinawa) Island had lost the apices. The description above is from perfect shells from Kikaiga-shima. The varices are all on the face and right side in the two type specimens, as stated in the original description, but this is merely accidental; in the larger series now received there are sometimes a few on the left side, though most of them are on the face, right side or back, usually scattered through an arc of a third of the circle, but sometimes several are in a line on successive whorls.

This species corresponds fairly well with A. Adams' description of *E. valida,* but that shell is said to be *straight,* and no dimensions are given. The curvature of *E. luchuana,* while slight, is readily appreciable.

Eulima articulata Sowerby. Pl. 11, fig. 11.

P. Z. S., 1834, p. 8; Conch. Illustr., fig. 12; Conch Icon., XV, Pl. 1, fig. 1.

The shell is straight, slender and regularly tapering, solid but not thick, glossy and nearly smooth, but fine, forwardly-oblique growth-scratches are visible under a lens. The varices are situated at intervals of three-fourths of a whorl, each marked by a white stripe followed by a brown one, an impressed line between them. Color pinkish-brown, with a white band below the suture and another at the periphery, both with articulated brown and white borders. Whorls 14, the upper

ones nearly flat, the last two or three more convex. The aperture is ovate, the outer lip, arched forward in the middle, retracted above. Columella arcuate, moderately calloused.

Length 24.5, diam. 6.3, length of aperture with peristome 5.2 mm.

Length 23.3, diam. 6.5, length of aperture with peristome 5.7 mm.

Hahajima, Ogasawara. No. 88,310, A. N. S. P., from No. 1,605 of Mr. Hirase's collection.

So far as I know, this species has been recorded hitherto only from Australia. I have not been able to compare Australian specimens, and various important details, such as the number of whorls, are not mentioned in the published descriptions. No critical comparison with them of the specimens from the Bonin Islands can therefore be made at this time.

Phorcus borealis n. sp. Pl. IV, figs. 29, 30.

Shell narrowly but deeply umbilicate, depressed, moderately solid, whitish ashen; the surface rather dull, smooth except for faint growth-striæ, and on the base excessively fine, close, subobsolete spiral striæ. Spire low, convex-conic, the periphery obtusely subangular, the base flattened. Whorls 4, convex, the last very wide. Aperture oblique, rounded-ovate, pearly with brilliant green reflections within, the lip with a wide, dull, whitish margin. Columella arcuate, rather thin; parietal callous thin. Umbilicus bounded by an angle. Operculum corneous, multispiral, the edges of the whorls slightly free.

Alt. 4, diam. 5.5 mm.

Kushiro, Kushiro, Hokkaido. Types No. 87,776, A. N. S. P., from No. 1,583 of Mr. Hirase's collection.

This little Gibbuloid snail is shaped like *Norrissia norrisi* of California. It does not resemble any Japanese species known to me.

Monilea nucleolus Pils.

See these *Proceedings* for 1904, Pl. 6, figs. 58, 58*a*. The locality, Yakujima, Ōsumi, was omitted in the original description.

Ethalia guamensis Quoy.

This species was described from a single specimen procured at Guam by the naturalists of the *Astrolabe*.[7] The figure represents the shell as having the umbilicus partly closed by a callous, but neither figure nor description show whether this partial closure is effected by (1) a callous pillar partly filling the umbilicus, or (2) by a mere reflection of the columellar margin, vaulting over a free umbilical cavity. A. Adams and subsequent authors have taken the first alternative and

[7] *Rotella guamensis* Q. and G., *Zool. Astrolabe*, III, p. 267, atlas Pl. 61, figs. 32, ?3

identified *guamensis* with a shell of which *Trochus callosus* Koch and *Rotella montrouzieri* Souv. are varietal forms. No form of this type which I have encountered agrees fully with Quoy's figures and description; and it is not impossible that the real *guamensis* yet remains unidentified, in which case *Ethalia montrouzieri* will become the senior name for the *guamensis* of most authors.

Ethalia guamensis sanguinea n. subsp. Pl. IV, figs. 21, 22.

Trochus callosus Koch, in Philippi, *Abhld.*, I, Pl. 4, fig. 2. Philippi in *Conch. Cabinet, Trochus*, Pl. 35, fig. 7 (copied in *Man. Conch.*, XI, Pl. 57, figs. 41, 42). Not *T. callosus* Gmel.

Shell imperforate, low-conoidal above, convex beneath; glossy and smooth except for fine growth-lines and almost obsolete spirals. White, copiously marbled with purple-brown and pinkish above, with some opaque white spots, and a few indistinct articulated spiral lines; the base white, with a pink central area. Whorls 5½, convex, the last wide, narrowly rounded at the periphery. Aperture oblique, ovate, the lip thin and simple, calloused near the columellar insertion, the umbilicus wholly filled by a red callous pad, roughened by several irregular vein-like grooves.

Alt. 10, diam. 15 mm.

Yakujima, Ōsumi. Types No. 88,312, A. N. S. P., from No. 1,458 of Mr. Hirase's collection.

This form differs from *E. g. selenomphala* by having the umbilicus wholly filled, both in half-grown and adult shells, by the roseate callous pad, as in *Helicina* or *Umbonium*. The general shape is not unlike, except that the spire is more regularly low-conic in *E. g. sanguinea*. Moreover, the upper surface is more coarsely maculate, and the base is white except near the central pad.

Probably "*Trochus callosus* Koch" of Fischer (*Iconogr. Coq. Vir.*, Pl. 115, fig. 3) should stand as another subspecies of *E. guamensis*. *Rotella montrouzieri* Souv. will be still another subspecies.

Ethalia guamensis selenomphala n. subsp. Pl. IV, figs. 27, 28.

Shell depressed, biconvex, glossy and smooth except for fine growth-lines and almost obsolete spiral lines on the last whorl. It is white, the upper surface sparsely marbled with purplish and pink, suffused with pink on the spire, and encircled with numerous fine lines articulated white and pink or brown. Base white, with a few pink spots. The upper surface is convex, the inner whorls only projecting in an acute little cone. Whorls 6½, convex, parted by a well-impressed suture, the last whorl very wide, narrowly rounded, almost subangular peripherally. The base is convex. The aperture is very oblique,

ovate, the lip thin and simple. The umbilicus is nearly filled by a callous mass ending in a flattened, pink lobe, reducing the umbilicus to a narrow semicircular cavity, which is bounded by a rounded, overhanging cord ending in a flattened callous at the lip.

Alt. 11, diam. 17 mm.

Hirado, Hizen. Type No. 88.313, A. N. S. P., from No. 1,526 of Mr. Hirase's collection.

Distinguished by its narrowly crescentic umbilical cavity, in which a very large spiral pillar stands, terminating in the callous pad, and nearly filling the umbilicus. In *sanguinea* the callous is red and completely fills the umbilicus in both half-grown and adult shells—or at least this is the case with the type lot.

The whole shell is more depressed than the specimens of *E. g. montrouzieri* before me, in which, moreover, the callous is white.

Fischer's figure of *E. callosa* (*Trochus callosus*) differs by its semicircular callous nearly surrounding a subcircular umbilicus.

Ethalia striolata A. Ad. and *E. trilobata* Sowb. have much the structure of *selenomphala*, but differ in the shape of the callous.

ETHALIELLA n. gen.

Depressed, openly umbilicated, smoothish *Trochidæ*, with the peristome obtuse, the columellar margin dilated, partly vaulting over the umbilicus, which is radially sulcate within and has a very low, wide and rounded marginal cord. Type *E. floccata*. Distribution, Indo-Pacific.

This group is to comprise species related to *Monilea*, *Ethalia* and *Isanda*, but with features of the columellar lip and umbilicus unlike either. *Minolia* and its boreal ally *Solariella* differ by the almost or quite unexpanded columellar margin.

The group will include, besides the type, *Ethalia rhodomphala* Smith, *Isanda pulchella* A. Ad., and *Trochus rhodomphalus* Souv.

Ethaliella floccata Sowb. Pl. IV, figs. 24, 25, 26.

Ann. Mag. Nat. Hist., XII, 1903, p. 500.

Shell much depressed, biconvex, obtusely carinate peripherally, openly umbilicate. Flesh-tinted, with a band below the suture composed of fine obliquely radial dark red lines alternating with white ones. This is followed in the middle of the upper surface by a spiral series of oblique, oblong red blotches alternating with opaque white ones. Below these there is a minutely white-speckled belt, and then at the periphery a series of red spots. On the base, the umbilicus is fleshy-whitish; outside of this there is a red area closely mottled with

opaque white; and between this tract and the periphery there is a pale zone, sometimes marked with distant radial series of two red dots each. The surface is smooth except at and above the periphery, where there are several spiral striæ. Whorls 5½, slightly convex, parted by an impressed suture. Umbilicus circular and deep, expanding funnel-like at the opening, where the sloping sides are excavated in the middle and finely sulcate radially. Aperture oblique, subcircular, the peristome obtuse, the columellar margin broadly dilated, covering a small part of the umbilicus.

Alt. 5, diam. 9 mm.

Alt. 4, diam. 7.7 mm.

Yakushima, Ōsumi. Topotypes No. 88.314, A. N. S. P., from No. 1,428 of Mr. Hirase's collection.

This species is evidently related to *Ethalia rhodomphala* E. A. Smith,[8] and *Isanda pulchella* A. Ad.[9] From the latter it differs by the much wider last whorl as viewed from above, and by the less extensively covered umbilicus and white callous. It differs from *E. rhodomphala* Smith chiefly by the color of the columellar callous. This is not a feature of much importance, and I would rank the Yakushima form under *rhodomphala* as a variety were it not that the name of that species is preoccupied for a new Caledonian form apparently referable to the same genus, *E. rhodomphala* Souv.[10]

Dentalium rhabdotum n. sp. Pl. V, figs. 45, 46, 47.

Shell curved posteriorly, the larger half nearly straight, slender, the diameter contained about 11 times in the length, moderately solid, lusterless; white, with more or less blackish incrustation. Sculpture of 12 acute, even ribs at the small end, parted by wider concave intervals; these ribs gradually become lower and wider, but usually retain their predominance over subsequently acquired sculpture to the end, though becoming low and obtuse. Secondary threads soon appear in the intervals, and on the last third of the shell tertiary threads, with some additional minor threads in some intervals, or riding on the slopes of the larger threads. In full-grown individuals all longitudinal sculpture becomes subobsolete close to the aperture. Growth-lines fine and obliquely circular throughout. The aperture is circular with rather thin peristome. Apical orifice ovate, the inner

[8] The Fauna and Geography of the Maldive and Laccadive Archipelagoes, II, Pt. 2, *Marine Mollusca*, p. 618, Pl. 36, figs. 1, 2 (1903).

[9] E. von Martens, List of the Shells of Mergui and Its Archipelago, in *Journal of the Linnean Society*, XXI, p. 197, Pl. 16, fig. 3*a*–3*e* (1887).

[10] *Trochus* (*Monilea*) *rhodomphalus* Souverbie, *Journal de Conchyliologie*, 1875, p. 36, Pl. 4, fig. 3. This species seems, as Fischer has suggested, close to *Trochus rotellæformis* Philippi, *Conchylien Cabinet*, *Trochus*, p. 302, Pl. 44, fig. 2.

layer usually projecting slightly, the margin shallowly notched at the narrow end of the orifice, the notch slightly excentric on the convex side of the shell (fig. 46).

Length 41, diam. at aperture 3.6, at apex 1 mm.

Length 29, diam. at aperture 3.1, at apex 1.2 mm. (immature shell).

Heda, Izu, with *D. coruscum*. Type No. 88,319, A. N. S. P.

This is probably nearer *D. weinkauffi* than to any other Japanese species now known. It apparently belongs to the group comprising *D. entalis, occidentale*, etc., and referred to the subgenus *Antalis*, but it is also about equally as much related to *D. agassizi*, a form from the Panamic region in 322 to 1,020 fms.

Dentalium (Lævidentalium) coruscum n. sp Pl. V, figs. 42, 43.

Shell well curved, thin-walled at the oral end, somewhat thickened at the apex, circular in section throughout; the greatest diameter contained 11 times in the length. White. The surface is polished, very faintly marked with growth-lines on the larger half. The apical orifice is shortly ovate, the narrow end toward the convex side of the shell, where there is a slight wave of the margin.

Length 33, diam. at apex 1, at aperture 3 mm.

Heda, Izu, at entrance to port, in 167 fms. Type No. 88,320, A. N. S. P.

This form is related to *D. leptosceles* Watson, and *lubricatum* Sowb. from Australia. My key to the species of *Lævidentalium* brings it to the latter species except in the matter of size, *lubricatum* being about double the dimensions of *coruscum*. This discrepancy, together with the widely separated habitats of the two forms, indicates specific diversity.

The curvature, measured from a chord connecting the ends, to the greatest convexity of the outer curve, is 4 mm., about one-eighth the length of the shell.

Dentalium (Rhabdus) cerinum n. sp. Pl. V, figs. 40, 41.

The shell is thin, almost straight, circular in section at the anal end, barely perceptibly compressed from side to side at the oral end; slender, the greatest diameter contained about 17 times in the length; translucent whitish. The surface is glossy, sculptured with very fine rather close and regular circular impressed lines and some coarser more widely spaced impressions indicating periods of growth-arrest.

Both apertures are simple, without slit or notch.

Length 33, diam. at apex .9, at aperture 1.9 mm.

Shimidzu, Suruga, off the spit. Type No. 88,305, A. N. S. P.

This species is allied to *D. rectius* Cpr. and *æquatorium* Pils. and Shp., but differs from both in its distinct though extremely minute annular sculpture. It is a typical *Rhabdus*, and the first to be found in Japanese waters.

Siliqua intuspurpurea n. sp. Pl. V, figs. 32, 33.

Shell regularly oblong, compressed, entirely covered with a glossy cuticle, green-yellow with darker olive concentric streaks, becoming purple toward the beaks, which, however, are white or whitish. The surface is lightly marked with growth-lines, and has a group of indistinct rays, composed of short, minute wrinkles in the direction of growth-lines, in the middle; and the dorsal surface posterior to the beaks is densely sculptured with minute raised radial lines. Upper and lower margins about equally convex; posterior end slightly truncate obliquely; anterior end rounded. Beaks at the anterior three-tenths of the length. Ligament short, black-brown, and prominent. Interior purple, the rib strong, straight and nearly vertical, whitish-purple. Pallial sinus extending anteriorly two-fifths the total length, its lower margin coalescent with the pallial line. Two cardinal teeth in each valve.

Length 41, alt. 21, diam. 9 mm.

Akkeshi, Kushiro (Hokkaido). Types No. 88,295, A. N. S. P., from No. 1,617 of Mr. Hirase's collection.

Related to the Californian *S. lucida* Conr., but that is a narrower species. The internal rib shows as an indistinct whitish ray outside.

Macrocallista chishimana n. sp.

The shell is oval, rather solid, white under a glossy cuticle. Drab with lighter concentric streaks, becoming pale yellow near the base and ends, and rather indistinctly marked with drab rays. Surface everywhere closely but irregularly concentrically plicate-striate. Under a strong lens a dense microscopic sculpture of papillæ and lines parallel to growth-lines is seen to cover the riblets and intervals. The dorsal and basal margins are about equally convex, the dorsal margin anterior to the beaks is nearly straight, the anterior end being rather narrowly rounded. The lunule is rather narrow, flat, bounded by a slightly impressed line. The interior is pure white, dull; the pallial sinus rather short and rounded. Teeth are rather slender. Margins of the valves are smooth and partly covered by the inflexed cuticle.

Length 64.5, alt. 48, diam. 28.5 mm.

Shikotan, Chishima (Kuril Is.). Type No. 88,301, A. N. S. P., from No. 1,615 of Mr. Hirase's collection.

This delicately colored clam is remarkably handsome for so northern a species. It has some resemblance to *Macrocallista pacifica* (Dillw.), a species better known as *Mcretrix* (or *Callista*) *chinensis* Chemn., but that species is smaller, more oblong and smoother, and it is more or less marked with purple.

A somewhat larger specimen of *M. chishimana*, measuring length 78, alt. 57, diam. 32.5 mm., was contained in a collection of shells of unknown locality, but all species of Yesso and northward, which has been in the Academy many years.

Dr. William H. Dall has shown that the well-known and appropriate name *Callista* cannot be used for this Venerid group, but I believe no one has noticed that it was originally based upon the single species *Mactra neapolitana* Poli (*Test. utr. Sicil.*, I, pp. 67 and xi, 1791). In a later volume Poli added several species of *Veneridæ;* but subsequent additions do not affect a name based upon a single species. *Callista* Poli is therefore a synonym of *Mactra* s. str.

Lithophaga lithura n. sp. Pl. V, figs. 37, 38, 39.

The shell is thin, cylindrical, brown, and sculptured with growth-lines only under a smooth, thin, gray-white calcareous layer, which almost completely envelopes it. The low beaks are very near the anterior end. The hinge-margin is but little raised, hardly modifying the cylindric contour, but the height of the shell diminishes slightly toward both ends. The anterior end is narrowly rounded, the *posterior end abruptly and squarely truncate.* The calcareous layer thickened at the posterior end, where it projects, is abruptly narrowed, and is *excavated on the inner faces, and continued in narrow posterior projections.* The valves are flesh-tinted within, becoming blackish-purple at the posterior end.

Length 37, alt. 12, diam. 9.5 mm.

Length 32.5, alt. 10, diam. 8.5 mm.

Kikaigashima, Ōsuni. Types No. 88,294, A. N. S. P., from No. 1,577 of Mr. Hirase's collection.

This species is remarkable for the posterior truncation of the valves, and their mucronate, internally excavated, stony tails.

Trapezium japonicum n. sp. Pl. V, figs. 34, 35, 36.

The shell is rather solid, oblong, the altitude nearly half the length, the beaks at the anterior sixth or seventh of the length. Surface dull and earthy, whitish with some red or livid stains, and roughened by growth-wrinkles which are most strongly marked posteriorly. Only small remnants of a thin cuticle remain near the ventral margin. Dorsal

margin convex, basal margin straight or a little concave (as in *Margaritana margaritifera*). Beaks low. No lunule. Escutcheon flat or slightly concave, lanceolate, very long, extending to the posterior end of the dorsal margin, bounded by acute elevated ridges. Interior white, often stained with violet in the cavity, or with some faint rays of the same color, or in some specimens it is delicately flesh-tinted, ochraceous toward the lower margin posteriorly. There is always a broad dark dorsal and posterior tract, dull violet in the cavity, but glossy blackish-purple between the posterior adductor scar and the posterior margin. There are three cardinal teeth, parallel to the long axis of the shell, in the right valve, the anterior one much the larger; the posterior tooth separated from the others, long and slender, lamellar. In the left valve there are also three, the anterior one very small. There is a short, strong lateral tooth in the right valve, a socket above it receiving a small process of the other valve.

Length 44, alt. 21, diam. 15 mm.

Length 36, alt. 17, diam. 12.7 mm.

Tsuda, Awa (Shikoku Is.). Types No. 88,293, A. N. S. P., from No. 1,622 of Mr. Hirase's collection.

This does not seem closely related to any *Trapezium* I have found described. There is a *Cypricardia formosensis* Dsh. enumerated in Paetel's *Catalog* (III Abth., 94, 1890), without reference, which I have been unable to trace. The name *Trapezium* is prior to the equivalent terms *Cypricardia* Lam. and *Libitina* Schum.

Trapezium japonicum delicatum n. subsp. Pl. V, fig. 44.

Similar in contour to *T. japonicum*, but thinner and smaller. The shell is partially covered with a very delicate corneous cuticle, deciduous toward the beaks; dull ashen, in large part stained with violet. Posterior half sculptured with delicate, subobsolete radial striæ, scarcely visible toward the margins except by being set with delicate, very minute and short cuticular spines. Interior dark livid purplish throughout, but darker at the posterior end. Lateral teeth very small.

Length 26.2, alt. 12.3, diam. 8 mm.

Length 24.3, alt. 12, diam. 8 mm.

Yokohama. Types No. 69,420, A. N. S. P.

Besides the differences given above, the escutcheon in this species is usually very asymmetrical, being much narrower in the left valve, where its limiting keel is nearly straight, while in *T. japonicum* it is nearly symmetrical.

Pecten awajiensis n. sp.

Shell solid, equilateral, both valves moderately convex, the right valve less so; lower half semicircular, the upper half straightly tapering. Convex valve dull purplish-white with purple-brown clouding and a few small white spots in the furrows. The other valve is light brown with some darker zones, and more white in the grooves.

Ears large, the posterior slightly longer. Ribs 17, high and rounded, and slightly wider than the intervals in the left valve, decidedly so in the right, where their margins slightly overhang the intervals. Growth-striæ fine, close and inconspicuous. Ears finely costellate. Anterior and posterior dorsal surfaces of the main disk flattened and smoothish. Interior white and strongly grooved, calloused above the muscle scar. Ctenolium short, of five teeth.

Length 48.6, height 47, diam. 14.5 mm.; length of the hinge-line 33 mm.

Fukura, Awaji. Type No. 88,300, A. N. S. P., from No. 1,636 of Mr. Hirase's collection.

This species is related to *P. singaporinus* Sowb. (*Thes. Conch.*, I, Pl. 14, fig. 71), from which it differs chiefly by the much coarser and less numerous ribs, 17 instead of 23 or 24. The dorsal half of the shell is also more wedge-shaped than in the Singapore scallop, of which a topotype is before me.

Reference to Plates II, III, IV and V.

Plate II, Fig. 1.—*Conus aratispira* n. sp.
Figs. 2, 3.—*Eulima ogasawarana* n. sp.
Fig. 4.—*Conus voluminalis avus* n. subsp.
Fig. 5.—*Natica hirasei* n. sp., exterior of operculum.
Fig. 6.—*Natica hirasei* n. sp., shell.
Figs. 7, 8.—*Eulima luchuana* Pils. Kikai-ga-shima, Ōsumi.
Figs. 9, 10.—*Eulima bovicornu* n. sp.
Fig. 11.—*Eulima articulata* Sowb. Hahajima, Ogasawara.

Plate III, Fig. 12.—*Siphonalia vanattai* n. sp.
Fig. 13.—*Maculotriton bracteatus longus* Pils. and Van.
Fig. 14.—*Usilla gouldii* Smith. Hahajima, Ogasawara.
Figs. 15, 16, 17. *Torinia densegranosa* n. sp.
Figs. 18, 19.—*Planaxis abbreviata ogasawarana* n. subsp.
Fig. 20.—*Buccinum chishimanum* Pils.

Plate IV, Figs. 21, 22.—*Ethalia guamensis sanguinea* n. subsp.
Fig. 23.—*Columbella pardalina subcribraria* n. subsp.
Figs. 24, 25, 26.—*Ethaliella floccata* Sowb. Topotype.
Fig. 27, 28.—*Ethalia guamensis selenomphala* n. subsp.
Figs. 29, 30.—*Phorcus borealis* n. sp.
Fig. 31.—*Cingula kurilensis* n. sp.

PLATE V, Figs. 32, 33.—*Siliqua intuspurpurea* n. sp.
Figs. 34, 35, 36.—*Trapezium japonicum* n. sp.
Figs. 37, 38, 39.—*Lithophaga lithura* n. sp.
Fig. 40, 41.—*Dentalium cerinum* n. sp. Lateral views.
Fig. 42.—*Dentalium coruscum* n. sp. Ventral aspect of apical end.
Fig. 43.—*Dentalium coruscum* n. sp. Lateral view.
Fig. 44.—*Trapezium japonicum delicatum* n. subsp.
Fig. 45.—*Dentalium rhabdotum* n. sp. Lateral view, natural size.
Fig. 46.—*Dentalium rhabdotum*. Ventral view of apical end.
Fig. 47.—*Dentalium rhabdotum*. Lateral view of oral end.